

AMENDMENTS TO THE CLAIMS

Claims 1-19 (cancelled)

Claim 20. (reinstated - formerly claim 11) A cyclonic device suitable for use in the contacting of vapor and liquid in a distillation or fractionation process, the cyclonic device comprising:

(a) a floor;

(b) a continuous side wall having an inner surface, an outer surface, an upper end and a lower end, the lower end terminating into the floor, the upper end defining an upper cyclonic region, and the side wall defining a contacting volume above the floor and below the upper cyclonic region;

E1 (c) at least one vapor opening in the floor for introduction of vapors into the contacting volume;

(d) at least one liquid downcomer positioned within the continuous side wall, the downcomer having:

(1) a side wall having an upper portion and a lower portion, the upper portion being located in the upper cyclonic region, and the lower portion extending to a point above the cyclone floor; and

(2) at least one downcomer port located proximate to the lower portion end of the downcomer, the port defining an opening in the downcomer for introduction of liquid above the floor into the contacting volume;

(e) a plurality of liquid outlets located on the continuous side wall; and

E1
cont.
(f) at least two spin vanes located between the continuous side wall and the downcomer side wall substantially at the mid-point of the upper and lower end of the continuous side wall.
